DOCUMENT RESUME

ED 465 331 HE 034 981

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TITLE The Effect of Library Instruction Learning Environments on Self-Efficacy Levels and Learning Outcomes of Graduate Students in Education.
PUB DATE 2002-04-00
NOTE 8p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 1-5, 2002).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Distance Education; *Graduate Students; Higher Education; *Instructional Effectiveness; *Library Skills; Outcomes of Education; *Self Efficacy; World Wide Web

ABSTRACT

The purpose of the study was to examine the effectiveness of three learning environments: (1) campus-based students who attended a classroom library instruction session; (2) campus-based students who completed a Web-based library tutorial; and (3) distance students who completed a Web-based library tutorial on library skills self-efficacy levels and learning outcomes among graduate students of education. Participant were 49 degree- and certificate seeking graduate students who completed a survey before and after the tutorials. Regardless of the learning environment, all groups significantly improved their library skills learning outcomes, as indicated by scores on the measure of library skills. Exposure to prior library instruction does appear to offer a significant effect on both pretreatment and postreatment self-efficacy levels and postreatment skills test scores. Results also suggest that an electronic tutorial may produce the same cognitive outcomes as classroom-based library instruction. (SLD)

The Effect of Library Instruction Learning Environments on Self-Efficacy Levels and Learning Outcomes of Graduate Students in Education

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2002

THE EFFECT OF LIBRARY INSTRUCTION LEARNING ENVIRONMENTS ON SELF-EFFICACY LEVELS AND LEARNING OUTCOMES OF GRADUATE STUDENTS IN EDUCATION

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Purpose: Mary Kennedy (1997) suggests that issues involving access to information have contributed to the perceived lack of connection between educational research and teacher practice. Traditional approaches have focused on ameliorating physical distance to information, but Kennedy proposes teachers also experience conceptual distance. Teachers simply are not accessing the body of scholarly literature available to reflect on or improve their professional teaching practices. Although Kennedy does not investigate *why* this is occurring, other studies have indicated students do not possess the requisite skills to effectively access and retrieve needed information (Fox and Weston, 1993; Greer, Weston, and Alm, 1991; Maughan, 2001).

Additionally, an increasing number of distance classes, programs, and degrees are currently being developed and offered in colleges of education, and teacher education programs and libraries are collaborating to find ways to provide quality library instruction to the off-campus user. Although many libraries are creating web-based library tutorials to accommodate these students, little research has been performed to investigate the effectiveness of web-based library and information skills tutorials as compared to library instruction conducted in a traditional classroom setting.

The purpose of the study was to examine the effectiveness of three learning environments: campus-based students who attended a classroom library instruction session, campus-based students who completed a web-based library tutorial, and distance students who completed a web-based library tutorial on library skills self-efficacy levels and learning outcomes among graduate students of education. A component of Bandura's (1977) social cognitive learning theory, self-efficacy is generally defined as the belief in one's ability to successfully perform a given behavior. Partly on the basis of self-percepts of efficacy, people choose what to do, the amount of effort to invest in activities, and how long to persevere at them. Self-efficacy research is meaningful as it is hypothesized that increased time spent at task may translate into better performance and, in turn, positively impact performance outcome.

Three hypotheses for the study were:

1) Higher levels of library skills self-efficacy would be positively correlated to higher scores on a library skills quiz.
2) Library skills self-efficacy levels would increase after treatment, but would not significantly vary across learning environment.
3) Library skills quiz scores would increase after treatment, but would not significantly vary across learning environment.

Sample: Participants were 49 masters, doctoral, and certificate-seeking students (40 females, 9 males) enrolled in one of three sections of a graduate-level research methods in education course at a mid-sized, urban university. The research methods course was selected as multiple sections are offered each semester, at least one is wholly web-based, and all students enrolled in the course are expected to complete a review of the literature. Participants were selected based on the criteria of enrollment in the course, anticipation of receiving formal library instruction, and agreement to participate in the study.

Methodology: Treatment consisted of three levels: group 1 - campus-based students who attended a classroom-based library skills session, group 2 - campus-based students who completed a web-based library tutorial, and group 3 - distance students who completed a web-based library tutorial. There were two within-subjects factors, library skills self-efficacy levels and knowledge of library skills. Self-efficacy scores were determined by responses on a library skills self-efficacy scale and library skills levels were indicated by performance on a test of library skills.

The survey was administered immediately prior to instructional session to assess students' levels of self-efficacy and knowledge of library skills. Testing was repeated approximately six weeks after the instructional session. Classroom-based instruction consisted of 65 to 70 minutes of lecture and demonstration of relevant library databases in the library laboratory. Hands-on time was allocated to enable students to immediately apply the information. The web-based library tutorial consisted of four interactive modules and participants spent an average of 80 minutes reviewing the tutorial.

Findings: To test hypothesis 1, a Pearson correlation coefficient was performed to examine the relationship between pretreatment self-efficacy scores and pretreatment library skills quiz scores. A significant correlation was found ($r = .39$, $p < .05$), indicating a moderate positive correlation between the two variables. Likewise, a Pearson correlation coefficient calculation revealed a similar relationship between final self-efficacy levels and final library skills scores ($r = .39$, $p < .05$). Thus, hypothesis 1 received support in that as library skills self-efficacy levels increased, so did scores on a test of library skills.

Covariate analyses require that the covariate be significantly related to the dependent variable. Similarly, multivariate analyses assume that multiple dependent variables are related. As such, a Pearson correlation coefficient was performed to determine if the model's covariates and dependent variables were related. Pretreatment self-efficacy levels were significantly correlated with posttreatment self-efficacy levels ($r = .56$, $p < .05$) and pretreatment library skills quiz scores were significantly correlated with posttreatment library skills quiz scores ($r = .49$, $p < .05$). Prior library instruction was significantly correlated with posttreatment self-efficacy levels ($r = .30$, $p < .05$) and posttreatment library skills quiz scores ($r = .28$, $p < .05$), thus meeting the relationship assumptions.

A repeated measures MANOVA was calculated comparing library skills self-efficacy levels and library skills quiz scores at two different times; immediately prior to treatment

and approximately six weeks later. A significant effect was found for self-efficacy levels ($F(1,48) = 47.72$, $p < .05$). Follow-up dependent *t*-tests revealed self-efficacy levels increased significantly from pretreatment ($M = 68.88$, $SD = 19.92$) to after library instruction ($M = 91.90$, $SD = 16.24$). A significant effect was also found for library skills quiz scores ($F(1,48) = 124.11$, $p < .05$). Follow-up dependent *t*-tests indicated library skills quiz scores increased significantly from pretreatment ($M = 58.78$, $SD = 13.86$) to post library instruction ($M = 73.16$, $SD = 12.65$). Both self-efficacy levels and library skills quiz scores significantly increased after treatment. The first part of hypothesis 2, which posited that library skills self-efficacy levels would increase after treatment, was supported. Likewise, the first part of hypothesis 3, which posited library skills quiz scores would increase after treatment, was also supported.

Dugard and Todman (1995) suggest in their analysis of repeated measures designs in educational research that using pretreatment scores as covariates may provide a more appropriate and informative analysis. As such, a MANCOVA was performed with pretreatment self-efficacy levels and library skills quiz scores as covariates. Due to its significant effect on final self-efficacy levels and library skills quiz scores, exposure to prior library instruction was also analyzed as a covariate.

A MANCOVA, with treatment as the independent variable and pretreatment self-efficacy levels, pretreatment library skills quiz scores, and prior library instruction as covariates indicated a significant difference among the three levels of treatment ($F(4,84) = 2.52$, $p < .05$). Univariate Fs, in between-subjects effects, revealed significant group differences on final self-efficacy levels ($F(2,43) = 3.97$, $p < .05$). Follow-up analyses indicated that Group 3, distance students/web tutorial ($M = 102.36$, $SD = 11.77$) differed significantly from Group 2, on-campus students/web tutorial ($M = 83.68$, $SD = 18.09$), ($F(2,46) = 6.59$, $p < .05$). Group 3 reported posttreatment self-efficacy levels 18.67 points greater than Group 2. This finding did not support the second part of hypothesis 2, which posited library skills self-efficacy levels would not vary across learning environment. No significant differences were found on final library skills quiz scores ($F(2,43) = 1.40$, $p > .05$), thus supporting the second part of hypothesis 3, which stated that library skills quiz scores would not vary across learning environment. No matter the learning environment, all participants demonstrated similar gains in library skills quiz scores.

Limitations: The fact that the library skills self-efficacy survey and library skills quiz have yet to be validated with this sample is cause for concern. Also, the possibility that the relatively small sample is not representative of the overall population of graduate students in education must be acknowledged. Results of this study would be more tenable by replication with a larger sample.

Conclusion: The purpose of the study was to examine the relative effectiveness of three different library instruction learning environments on self-efficacy levels and learning outcomes for graduate students in education. Regardless of the learning environment examined, all groups significantly improved their library skills learning outcomes, as indicated by scores on a measure of library skills.

The condition of exposure to prior library instruction does appear to offer a significant effect on both pretreatment and posttreatment self-efficacy levels and posttreatment library skills quiz scores. Although pretreatment library skills quiz scores were five points higher on the average for participants who had received prior library instruction, outcomes were not significant at the .05 level. This pattern suggests, however, that repeated library instruction may have a cumulative effect on learning. If further investigation clarifies this relationship, then support would be provided that students could benefit from repeated library instructional opportunities throughout their academic careers.

Perceived self-efficacy is a well-established construct that suggests that people are more likely to engage in activities in which they feel efficacious. Further, the skills and characteristics constituting the construct of self-efficacy are alterable by interventions (Bandura, 1995). That is, students may learn to develop and increase affective factors that are associated with performance. In this study, exposure to library instruction, regardless of treatment, resulted in significantly greater levels of self-efficacy. Also, students who felt more efficacious demonstrated higher scores on the library skills quiz.

Between-group patterns were not so easy to discern. Although differences in average scores on the library skills quiz were not significant between groups, significant differences were found in self-efficacy levels. Posttreatment self-efficacy levels between group 2 (campus-based students who completed an electronic library tutorial) and group 3 (distance students who completed an electronic library tutorial) were significantly different. Group 2 demonstrated the greatest learning gains, but reported the lowest self-efficacy gains in between-group comparisons. There is not enough evidence to conclude if learning environment differences, in the sense that campus-based students were uncomfortable with the electronic tutorial, may be indicated for group 2, or if the self-efficacy levels of group 3 were related to their experience and facility with web-based learning environments.

Recommendations: From a practical perspective this study should prove valuable for several reasons. First, as the growth of distance education continues, libraries and colleges of education will continue to be challenged to deliver instruction that meets user demand for mediating off-campus access to information resources. Utilizing online tutorials as library support for distance research methods classes appears to serve students very well. Distance students indicated they felt the tutorial was useful in assisting with their review of the literature assignment, and one student noted that she used the tutorial as a reference, consulting it whenever she had a question or needed to refresh her knowledge of database searching.

Second, an electronic library tutorial such as the one used in this study may produce the same cognitive outcomes as classroom-based library instruction. The tutorial in this study was used for on-campus as well as distance students, thus indicating it may be a viable replacement for traditional library instruction sessions. As course syllabi become increasingly more compressed an electronic tutorial may provide some relief by replacing class time devoted to library instruction. Some of the fears of replacing face-to-face

interaction with a librarian seem unwarranted in terms of impact on academic performance. These results may offer instructors a choice of strategies that can be employed with students throughout their teacher education program.

Finally, regardless of learning environment, library instruction appears to positively influence library skills self-efficacy levels and learning outcomes. Effective library and information skills are fundamental to producing teachers who are informed managers of the voluminous amounts of information that inundate us all daily, and who can search for, retrieve, and critically evaluate information pertinent to their personal and professional needs. As such, library instruction should be an integral part of all teacher education programs.

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